

# Memorandum

DATE: OCT 29 2007

REPLY TO: EM-60 (Dr. James Shuler, 301-903-5513)  
ATTN OF:

SUBJECT: DOE Certificate of Compliance No. 9150 Revision 0

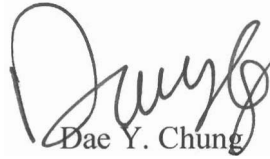
TO: Paul Mann, NA-124

Per your request, attached is Revision 0 (with Approval Record) of Department of Energy (DOE) Certificate of Compliance (CoC) No. 9150 for the PAT-2 shipping container. This certificate expires October 31, 2012. The certificate is issued to permit cancellation of the Nuclear Regulatory Commission (NRC) CoC USA/9150/B(U)-85, Revision 7. Although the NRC CoC 9150 is one of two NRC CoCs approved for shipment of plutonium by air, the DOE CoC 9150 is only approved for shipments by land and sea. Shipments by air are not authorized. No one in the DOE community is willing to sponsor the NRC CoC 9150 for two reasons; 1) the NRC costs and 2) because there are no planned DOE shipments using the NRC CoC 9150. The main purpose of the DOE CoC is to allow shipments of the existing PAT-2 packagings for burial/disposal. The need for the PAT-2 packagings for other non-air shipments is not likely because there are other certified containers that are available for non-air shipments.

The Federal regulations under 10 CFR 71.88 (Air Transport of Plutonium) explicitly prohibit the transportation of plutonium by air or the delivery to a carrier for air transport unless the plutonium is 1) in a medical device, 2) in a form with a specific activity no greater than 0.002  $\mu\text{Ci/g}$ , 3) shipped in a single package with no more than a specified quantity, and 4) shipped in a specifically authorized NRC-package with a Certificate of Compliance. Because the DOE CoC is based on the NRC CoC, which is has been authorized by NRC for air shipments, the DOE CoC may meet the requirements for 10 CFR 71.88. However this interpretation would likely require formal review by NRC and/or DOT. Because there is no need for DOE air shipments under NRC 9150 (and therefore DOE 9150), DOE will only issued the CoC for non-air shipments and will not request an interpretation from NRC and/or DOT.

In the near future, we will be asking the NRC to cancel their certificate for this packaging effective November 30, 2007, per your request.

If you have any questions, please contact Dr. James Shuler at (301) 903-5513.

A handwritten signature in black ink, appearing to read 'Dae Y. Chung', is positioned above the printed name.

Dae Y. Chung  
Headquarters Certification Official  
Safety Management and Operations  
Office of Environmental Management

Attachment

**cc:**  
James Shuler, EM-60

U.S. DEPARTMENT OF ENERGY  
CERTIFICATE OF COMPLIANCE  
For Radioactive Materials Packages

1a. Certificate Number	1b. Revision No.	1c. Package Identification No.	1d. Page No.	1e. Total No. Pages
9150	0	USA/9150/B(U)-85 (DOE)	1	4

2. PREAMBLE

- 2a. This certificate is issued under the authority of 49CFR Part 173.7(d).
- 2b. The packaging and contents described in Item 5 below meet the safety standards set forth in subpart E, "Package Approval Standards" and subpart F, "Package and Special Form Tests" Title 10, Code of Federal Regulations, Part 71.
- 2c. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. This certificate is issued on the basis of a safety analysis report of the package design or application —		
(1) Prepared by (Name and Address):	(2) Title and identification of report or application:	(3) Date:
U. S. Department of Energy Washington, D.C. 20585	PAT-2 (Plutonium Air-Transportable Model 2) Safety Analysis Report, SAND81-0001, Printed 1981, as supplemented. Note: Shipments by Air are not authorized.	July 1981

4. CONDITIONS

This certificate is conditional upon fulfilling of the applicable Operational and Quality Assurance requirements of 49CFR parts 100 – 199 and 10CFR Part 71, and the conditions specified in Item 5 below.

5. Description of Packaging and Authorized Contents, Model Number, Transport Index, other Conditions, and References:

(a) Packaging

(1) Model Number: PAT-2

(2) Description

A superalloy primary containment vessel (TB-2) surrounded by a protective overpack (AQ-2). The contents which may be in canisters are contained within a capsule (C-1) within the TB-2.

The AQ-2 overpack is a right circular cylinder, approximately 356 mm (14 inches) high and 381 mm (15 inches) in diameter with protruding handles attached to the cylinder outer walls. The outer shell is a double walled stainless steel structure with rounded end caps, riveted on the bottom and bolted at the top. An inner grain oriented maple wood protective case houses the TB-2; it is surrounded by a titanium load spreader which is further surrounded by a grain oriented redwood protective case.

a. Date of Issuance: <b>OCT 29 2007</b>	6b. Expiration Date: <b>October 31, 2012</b>
FOR THE U.S. DEPARTMENT OF ENERGY	
7a. Address (of DOE Issuing Office): U.S. Department of Energy Office of Environmental Management, EM-60 1000 Independence Avenue, SW Washington, DC 20585	7b. Signature, Name, and Title (of DOE Approving Official):  Dae-Y. Chung Safety Management and Operations (EM-60) Headquarters Certifying Official

The TB-2 containment vessel consists of (2) iron-base superalloy sections, bolted together with (20) bolts, forming an 88 mm (3.46 inch) diameter sphere. A copper gasket held between knife-edge sealing beads on the matting hemispherical surfaces of the TB-2 provides a seal.

The C-1 capsule is a stainless steel cylinder with a nominal 44 mm (1.80 inch) diameter and nominal 70 mm (2.76 inch) length; it has a screw top lid which is sealed with teflon tape.

Brass or aluminum canisters may be used in the C-1 capsule to hold various radioactive contents. The canisters may have quartz or glass liners.

The package gross weight is approximately 33kg (73 pounds).

(3) Drawings

The packaging is constructed in accordance with specifications and drawings, as listed by document number, issue, and title in the List of Data LD-T67000-000, page 1, issue D and page 2, issue D (Chapter 9 of Safety Analysis Report, SAND81-0001 July 1981)

(b) Contents

(1) Type and Form of Radioactive Material

Plutonium, uranium, or mixture of plutonium-uranium in various isotopic compositions in solid form as:

- (i) oxide powder, sintered oxide pellets, and metal;
- (ii) plutonium sulfate tetrahydrate,  $\text{Pu}(\text{SO}_4)_2 \cdot 4\text{H}_2\text{O}$  and plutonium nitrate dehydrate,  $\text{Pu}(\text{NO}_3)_4 \cdot 2\text{H}_2\text{O}$ .

(2) Maximum Quantity of Radioactive Material per Package

- (i) For the contents described in 5(b)(1)(i): Not to exceed 15 grams fissile material, 120 grams mass, 2 watts decay heat, or 0.5 gram water.
- (ii) For the contents described in 5(b)(1)(ii): Not to exceed 3 grams or 0.5 grams water in addition to the water of hydration

(c) Conditions:

- (1) Up to 9 grams of polyvinylchloride (PVC), 18 grams of quartz ( $\text{SiO}_2$ ) or glass, 50 grams of brass, and 16 grams of aluminum may be used within the C-1 capsule for packaging of contents. Up to 0.3 gram of polytetra-fluoroethylene (PTFE) tape may be used to seal the C-1 capsule.
- (2) The C-1 capsule need not be leak tested when the activity of plutonium contents does not exceed 20 Ci per package.
- (3) A maximum of 2.0 grams of aluminum foil may be used to shim the C-1 within the TB-2 to avoid relative movement between the two.
- (4) Prior to first use, each package must meet the criteria for the acceptance tests specified in section 8.1 of Chapter 8 of the Safety Analysis Report (SAND81-0001, printed July 1981)

- (5) Prior to each shipment, the package must meet the criteria for inspections and tests specified in section 8.2 of Chapter 8 of the Safety Analysis Report (SAND81-0001, printed July 1981)
- (6) Periodic testing and maintenance of the package must be in accordance with section 8.3 of Chapter 8 of the Safety Analysis Report (SAND81-0001, printed July 1981)
- (7) Operating procedures must be in accordance with Chapter 7 of the Safety Analysis Report (SAND81-0001, printed July 1981)
- (8) The package authorized by this certificate is approved for land and sea shipments only. Shipment by air is not authorized.

(d) References

This DOE CoC is based on Revision 7 of the NRC CoC USA.9150/B(U)-85. The references below track the seven revisions of NRC CoC 9150. The primary reference is PAT-2 (Plutonium Air-Transport Model 2) Safety Analysis Report, SANDIA Report No. SAND81-0001, July 1981

- (1) NRC CoC USA/9150/B( ), Revision 0, issued on September 14, 1981 with an expiration date of September 30, 1986. The DOE application was dated April 31, 1981. The CoC was issued based on PAT-2 (Plutonium Air-Transport Model 2) Safety Analysis Report, SANDIA Report No. SAND81-0001, July 1981.
- (2) NRC CoC USA/9150/B(U), Revision 1, issued on September 16, 1983 with an expiration date of September 30, 1986. The DOE supplement of April 19, 1983 requested changes in the storage location requirements. Although the DOE supplement of April 19, 1983 was referenced for Revision 1, Revision 1 was issued for a change in the regulations and did not extend the storage locations which were addressed in Revision 2
- (3) NRC CoC USA/9150/B(U), Revision 2, issued on October 31, 1983 with an expiration date of September 30, 1986. The DOE supplement of April 19, 1983 requested changes in the storage location requirements. The DOE application of August 3, 1983 contained DOE's acceptance of the condition that no other cargo could be stored aft of the PAT-2 package. Revision 2 allowed additional storage location and included the condition of no other cargo be stored aft of the PAT-1 package.
- (4) NRC CoC USA/9150/B(U), Revision 3 was issued on July 30, 1986 with an expiration dated of July 31, 1991. The DOE application of July 15, 1986 stated there were no changes and requested renewal. The CoC was issued with no changes.
- (5) NRC CoC USA/9150/B(U), Revision 4 was issued on August 7, 1991 with an expiration date of July 31, 1996. On May 14, 1991 NRC requested a review of operational and acceptance procedures be part of the renewal effort. On July 16, 1991, DOE requested a 3 month extension of the NRC CoC to allow time for a review of the operational and acceptance procedures to meet the NRC request. On August 12, 1991 DOE stated that the operating procedures, acceptance tests, and maintenance program were up-to-date, complete, and accurate. On August 7, 1991 NRC stated that since there were no changes to the design the CoC was extended until July 31, 1996.

- (6) NRC CoC USA/9150/B(U)-85, Revision 5 was issued on July 19, 1996 with an expiration date of July 31, 2001. The DOE application of May 29, 1996 stated there were no changes and requested renewal. The NRC July 19, 1996 approval record stated "The package identification number has been revised to USA/9150/B(U)-85 to indicate the package design meets the requirement of the new regulations."
- (7) NRC CoC, USA/9150/B(U)-85, Revision 6, was issued on August 2, 2001 with an expiration date of July 31, 2006. The DOE application of May 24, 2001 stated there were no changes and requested renewal. The CoC was issued with no changes.
- (8) NRC CoC, USA/9150/B(U)-85, Revision 7, was issued on October 1, 2006 with an expiration dated of September 30, 2011. The DOE application of June 1, 2006 stated there were no changes and requested renewal. The CoC was issued with minor changes in the regulator reference of Item 14 and Item 16 was added to allow the use of Revision 6 until September 30, 2007.



**Department of Energy**  
Washington, DC 20585

OCT 29 2007

**PACKAGE CERTIFICATION APPROVAL RECORD**  
Certificate of Compliance USA/9150/B(U)-85 (DOE), Revision 0  
PAT-2 Shipping Container

Docket 07-42-9150

The Department of Energy Certificate of Compliance USA/9150/B(U)-85 (DOE) for the PAT-2 Shipping Container is issued on the basis of Revision 7 of the Nuclear Regulatory Commission (NRC) Certificate of Compliance USA/9150/B(U)-85, which expires September 30, 2011. The DOE certificate is issued to permit cancellation of the NRC certificate and continued use of the packaging under the DOE certificate. The DOE certificate is restricted to shipments by land and sea. Air shipments are not authorized.

This certificate constitutes authority for the Department of Energy to use the PAT-2 Shipping Container for shipment of the authorized contents under 49 CFR 173.7(d).

**Dae Y. Chung**  
Headquarters Certifying Official  
Safety Management and Operations  
Office of Environmental

Management

Date: 10/29/07

